RETROSPECTIVE ANALYSIS OF INCIDENCE OF DENTAL CARIES IN POSTERIOR TEETH BETWEEN DIABETIC AND NON DIABETIC PATIENTS

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ABSTRACT:

Introduction: Diabetes mellitus (DM) is a common chronic metabolic disorder which affects millions of people. At present, India has the highest incidence of diabetes worldwide. Several oral lesions and conditions are associated with diabetes. However, there is a lack of consensus among researchers regarding the relationship between DM and dental caries. Hence, the present study was carried out to assess the posterior teeth caries prevalence among diabetic and nondiabetic adults.

Materials and methods: It is a retrospective , cross sectional study conducted among patients visiting a University dental hospital in Chennai. Microsoft Excel was used for tabulation of the parameters and then the data was exported to the SPSS software version 20.0. Descriptive statistics and relation between variables was determined using the chi square test, where $p<0.05$ was considered statistically significant.

Results: In the present study, The most common age group was 28-37 years (33.9%). The most common gender was found to be male (64.0%). Most of the patients were non diabetic (71.8%). Most of the patients had caries in both anterior and posterior teeth (33.9%). Majority of the non diabetic patients had caries in posterior teeth (34.5%) whereas diabetic patients had dental caries in both anterior and posterior teeth (28.2%).

Conclusion: Within the limits of the study, Majority of the non diabetic patients had caries in posterior teeth whereas diabetic patients had dental caries in both anterior and posterior teeth .

Keywords: diabetes, dental caries, posterior teeth ,innovative technique

INTRODUCTION:

Diabetes mellitus (DM) is a common chronic metabolic disorder affecting millions of people. According to the World Health Organization (WHO), any disease having a prevalence of more than 1% should be considered as a disease of public health importance (1). The prevalence of diabetes for all age groups worldwide was estimated to be 2.8% in 2000 and may reach 4.4% by 2030 (2).

Oral cavity and contagious structures can be dramatically affected by diabetes. These oral complications have important effects on the quality of life of patients with diabetes and can also directly and indirectly affect glycemic control (3). Oral lesions and conditions associated with diabetes include xerostomia, burning mouth, gingivitis, periodontal disease, dental caries, and candidal infection (4).

The relationship between diabetes and dental caries, particularly among adults, has received less attention so far despite of the fact that both the diseases are associated with ingestion of carbohydrates (5) and that insulin deficiency in diabetes may lead to hyposalivation and elevated salivary glucose level, which may put diabetic patients at a high risk of developing caries (6).

The high caries might be because of more frequent meals in diabetic patients than normal patients and repeated intakes of even small amounts of carbohydrates may be cariogenic when coupled with elevated blood glucose level and hyposalivation (7). Diabetic patients showed a higher prevalence of root caries and periodontitis, and also found factors associated with dental caries such as salivary buffer capacity and tooth loss (8–11). Posterior teeth are more affected compared to anterior teeth as they are much more likely to be used for chewing and are not cleaned properly compared to the anterior teeth.

The aim of the study is to determine the incidence of dental caries in posterior teeth between diabetic and non-diabetic patients. Our team has extensive knowledge and research experience that has translated into high quality publications (12–21),(22–25),(26–30) (31).

MATERIALS AND METHODS:
The present study is a retrospective study. This study was approved by the institutional ethnic board.
Data Collection
A single calibrated examiner evaluated the digital case records of patients who reported to Saveetha Dental College from June 2019 to March 2021. For the present study, inclusion criteria was data of patients with dental caries.
Inclusion criteria:
  ● Patients with dental caries
  ● Patients who are diabetic or non-diabetic
Exclusion criteria:
  ● Patient with no dental caries
  ● Incomplete data
The retrospective study was carried out with the help of digital case records of 1114 patients who reported to the hospital. Ethical clearance to conduct this study was obtained from the Scientific Review Board of the hospital.
Data analysis

The collected data was tabulated and analysed with Statistical Package for Social Sciences for Windows, version 20.0 (SPSS Inc., Vancouver style) and results were obtained. Categorical variables were expressed in frequency and percentage. Chi square test was used to test association between categorical variables. Chi square tests were carried out using age, gender as *independent variables* and diabetes and location of caries as *dependent variables* . The statistical analysis was done by pearson chi square test. P value < 0.05 was considered statistically significant.

RESULTS:
In the present study, The most common age group was 28-37 years (33.9%) **(Figure 1)**. The most common gender was found to be male (64.0%) **(Figure 2)**. Most of the patients were non diabetic (71.8%) **(Figure 3)**. Most of the patients had caries in both anterior and posterior teeth (33.9%)**(Figure 4)**. Majority of the non diabetic patients had caries in posterior teeth (34.5%) whereas diabetic patients had dental caries in both anterior and posterior teeth (28.2%) **(Figure 5)**.

DISCUSSION:
The prevalence of dental caries and its burden on the general population is of significant public health interest. Reduction of untreated dental caries and tooth extractions as a consequence of dental caries among adults by 15% are among the Healthy People 2010 objectives for oral health (1). Therefore, it is important to identify patients who may be at particularly high risk of dental caries. DM, a significant public health problem in its own right, may increase one's susceptibility to dental caries (32) . In addition, people with diabetes are also more prone to infections, including dental abscesses that result from progressive dental caries. Therefore, the present hospital-based cross-sectional study was conducted to assess and compare dental caries of diabetic patients with that of nondiabetics.

In the present study, The most common age group was 28-37 years (33.9%) (figure 1). The most common gender was found to be male (64.0%) (figure 2). Nowadays, young people are found to be more affected by dental caries due to maintaining poor oral hygiene. Male patients were found to be more affected by caries according to a study by Kanjirath (33). Most of the patients were non diabetic (71.8%) (Figure 3). Most of the patients had caries in both anterior and posterior teeth (33.9%)(figure 4).

Majority of the non diabetic patients had caries in posterior teeth (34.5%) whereas diabetic patients had dental caries in both anterior and posterior teeth (28.2%) (figure 5). The prevalence of dental caries was significantly lower among diabetic patients than nondiabetic patients. On the contrary, Several other authors have reported similar findings (5,33–37) while some authors have reported no difference (10,38,39) and few have reported low prevalence of dental caries among diabetics (40,41) .

It must be emphasized that the results of this study may not be directly comparable with the results of others. This is due to many differences such as the population size and selection criteria for diabetic and nondiabetic groups. Because this was a hospital-based study, the results may not be generalized which suggests a larger scale, community level research in this field.

CONCLUSION:

Within the limits of the study, Majority of the non diabetic patients had caries in posterior teeth whereas diabetic patients had dental caries in both anterior and posterior teeth . This study aims in determining the incidence of dental caries in posterior teeth among diabetic patients and also to create awareness on diabetes as a cause for various oral hygiene disorders.

Conflict Of Interest:

 There was no potential conflict of interest.

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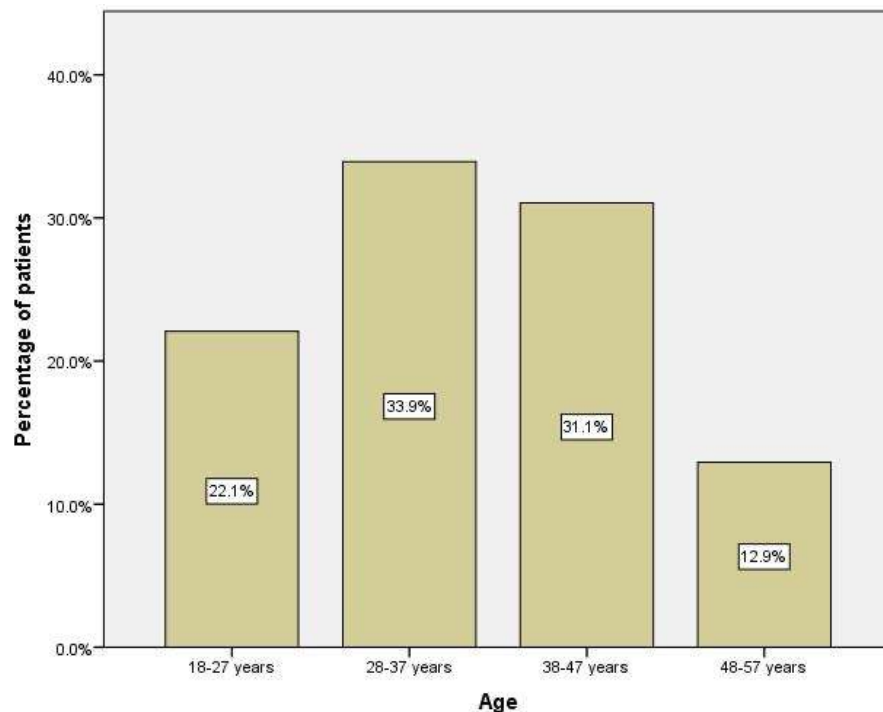
Figure 1: depicts the age group of patients with dental caries . The X axis depicts the age and Y axis as the percentage of patients. The most common age group was 28-37 years (33.9%).
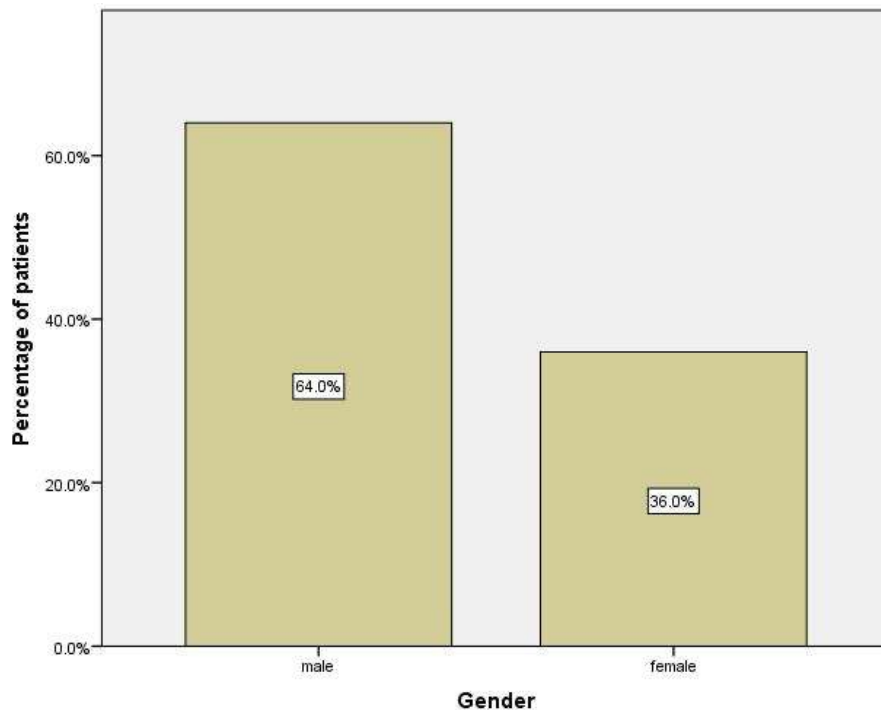
Figure 2 :depicts the gender of patients with dental caries . The X axis depicts the gender and Y axis as the percentage of patients. The most common gender was male (64.0%).
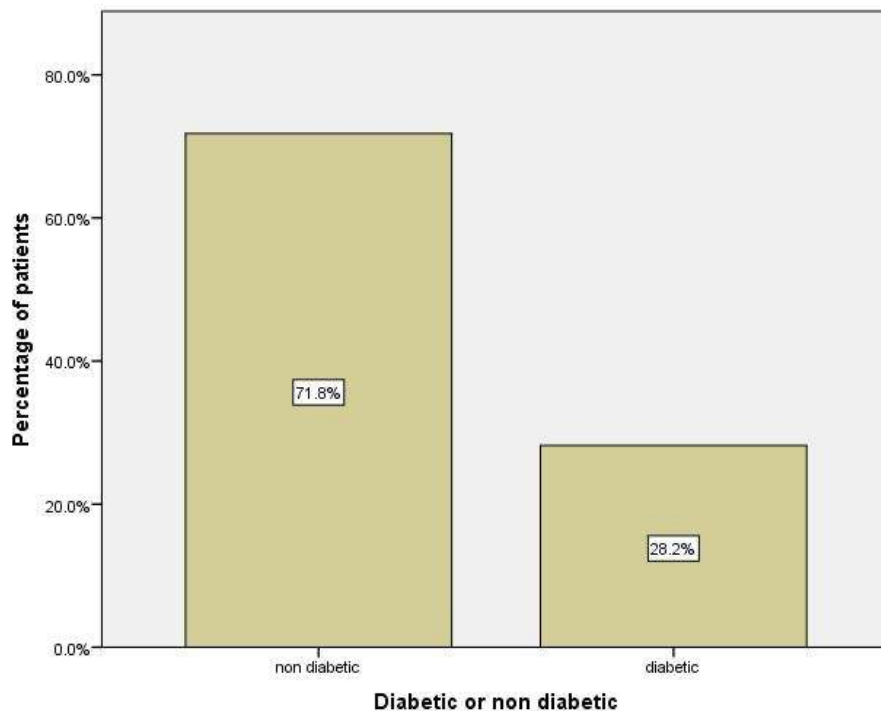

Figure 3:depicts the diabetic or non diabetic status of patients with dental caries . The X axis depicts whether the patient is diabetic or non diabetic and Y axis as the percentage of patients. Most of the patients were non diabetic (71.8%).
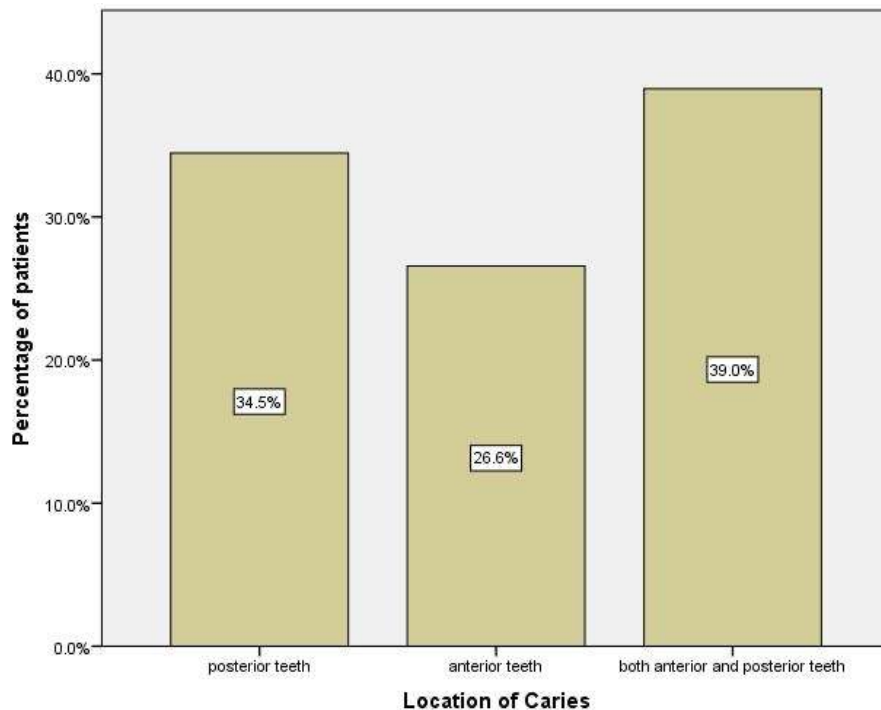
Figure 4:depicts the location of the dental caries of patients . The X axis depicts the location of the dental caries and Y axis as the percentage of patients. Most of the patients had caries in both anterior and posterior teeth (33.9%).
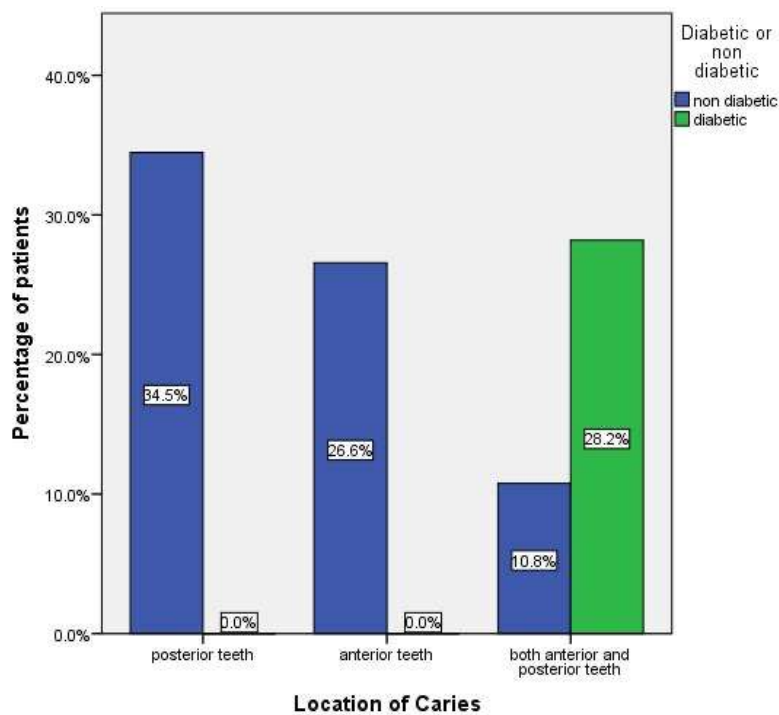
Figure 5: shows the association between location of caries and whether the patient is diabetic or non diabetic . The X axis represents the location of dental caries and Y axis the percentage of patients .Blue bar denotes necrotising sialometaplasia, green denotes sialadenitis and brown denotes sialolith . Majority of the non diabetic patients had caries in posterior teeth (34.5%) whereas diabetic patients had dental caries in both anterior and posterior teeth (28.2%). However, there was a significant difference between location of dental caries and whether the patient is diabetic or non diabetic . Pearson Chi square test, p =0.000 (p<0.05, statistically significant).